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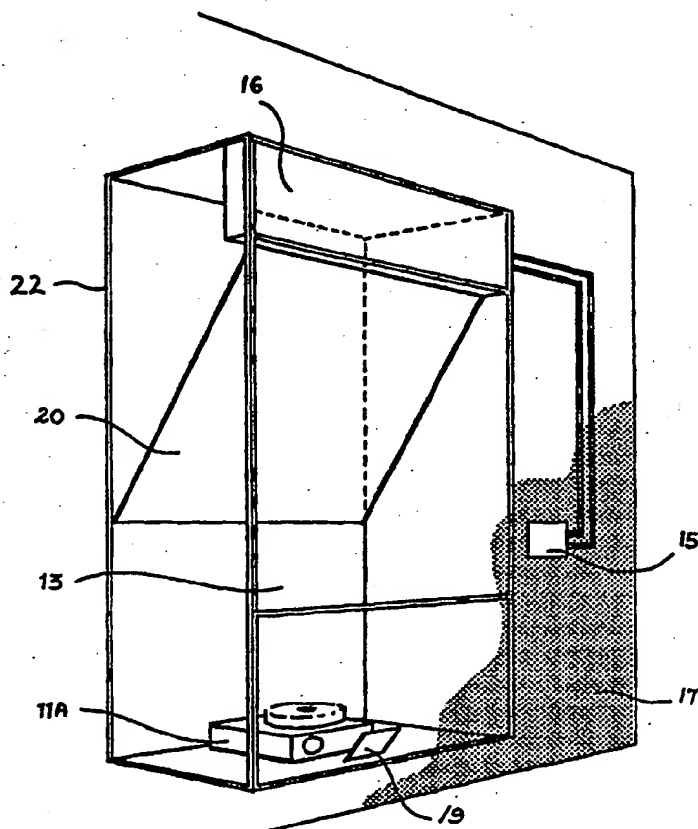
**PCT**WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau

## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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**(54) Title: RETAIL DISPLAY APPARATUS****(57) Abstract**

The apparatus comprises display means comprising a projector (11) and a back projection screen (13) for displaying pre-recorded visual images and associated text and a central processor (14) for controlling the display means together with a manually operable remote control (15) to enable a user to interactively control the images and text displayed. The apparatus may be used within a shop window to provide an image, typically 1.5 - 2.5 m wide x 1.5 - 2.0 m high, visible to potential customers outside the shop both during daylight and at night.



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RETAIL DISPLAY APPARATUSTECHNICAL FIELD

This invention relates to retail display apparatus for simultaneously displaying a pre-recorded visual image and an associated text for advertising products and/or services in, for example, a "shop-window".

BACKGROUND ART

The vast majority of shop window displays are static display of items for sale and/or of static notices describing and/or illustrating goods or services for sale. Moving displays are sometimes used for successively displaying different items or notices. Electronic textual displays are also known. However, there remains a need for a more flexible system for displaying and advertising a wide range of goods and/or services which is capable of operating in the confined space usually available in a shop window and in high ambient light levels.

DISCLOSURE OF INVENTION

According to a first aspect of the invention there is provided retail display apparatus comprising: display means for displaying pre-recorded visual images and associated text, the display means comprising a projector and a back projection screen; programmable central control means for controlling the display means; and manually operable remote control means connected to the central control means for enabling interactive operation of the apparatus by a user.

Such retail display apparatus may, for example, be used as a sales aid for estate agents with the central control means being programmed to cause the display means to display successively a number of photographs of available properties, and, whilst each photograph is being displayed to successively display various particulars of each property.

The manually operable remote control unit be interactively operated by a user so they can select the products and/or services they are interested in.

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An estate agent may, for example, programme the apparatus with pictures of various properties which are selectively displayed by the central processor in response to a user manipulating the remote control unit in accordance with prompts and/or menus displayed by the text display, such as to select and display only properties falling within the users designated requirements with further information then being given on the text display.

The display means may comprise a slide projector arranged for back projection of slides onto a screen, or may comprise a video projection unit connected to a magnetic tape, compact disc (CD) or electronic memory storing the images.

The display means may include an alphanumeric display device.

The central control unit may comprise a PC or similar small computer, or a central processor may be used with a 'smart card' or other programmable means.

The manually operable remote control unit may conveniently comprise a "touch screen" unit in which signals are generated through a membrane, induction, or a grid reference LED system, connected to the central control unit by cable or by an infra-red transmitter. The remote control unit is preferably operable through a sheet of glass such as a shop window and may be a simple "through-the-glass" keypad.

According to a second aspect of the invention there is provided a method of advertising products or services characterised in that the products or services are illustrated by pre-recorded images displayed by retail display apparatus as claimed in any of the preceding claims such that the display may be interactively and selectively viewed with associated text by potential customers.

Other features of the invention will be apparent from the following description and the subsidiary claims of the specification.

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BRIEF DESCRIPTION OF DRAWINGS

The invention will now be further described, merely by way of example, with reference to the following drawings in which:

Figure 1 is a schematic view of retail display apparatus according to a first embodiment of the invention as seen by a user;

Figure 2 is a perspective view of the apparatus shown in Figure 1;

Figure 3 is a side view of the apparatus shown in Figures 1 and 2;

Figure 4 is a perspective view of retail display apparatus according to a second embodiment of the invention;

Figure 5 is a side view of the apparatus shown in Figure 4;

Figure 6 is a perspective view corresponding to Figure 2 showing the apparatus in use in a shop window;

Figure 7 is a perspective view corresponding to Figure 2 showing the use of a blind;

Figure 8 is an illustrative view showing how the apparatus of Figures 1 and 2 could be utilised to provide high street "shop window" displays; and

Figure 9 is a side view of retail display apparatus according to a third embodiment of the invention.

BEST MODE OF CARRYING OUT THE INVENTION

The display apparatus illustrated in Figures 1, 2 and 3 includes a microprocessor controlled slide projector 11A having a magazine loaded with photographic slides showing a selection of properties available for sale.

The projector 11A is arranged to project an image of each property (such as 12 in Figure 6) onto a back-projection screen 13.

The projector is connected to a central control unit comprising a small computer 14 which is connected to a manually operable control 15 such as a "through-the-glass" keypad and also to an LED display unit 16.

The apparatus is located within an estate agent's or other shop window with only the manual control 15 being accessible from the street.

In some cases, depending on the intensity of the image display, the shop window may advantageously be provided with a blind 17 (see Figures 3 and 7) that includes viewing apertures 18, and the blind 17 may be operated automatically by an electric motor (not shown) in response to a photo-sensor (not shown) when ambient light levels would otherwise be too high to allow efficient viewing of an image on the screen 13 and/or of the LED's 16. The blind itself may carry a conventional static display. In some circumstances the blind may be activated during daylight hours to provide a static display but withdrawn when the light levels fall sufficiently (eg in the evening) to allow the projected image to be displayed.

In operation, the central control unit is programmed such as to cause the LED's to display a suitable message to attract passing potential customers, and to give them a menu or prompts such that they can readily operate the manual control 15 to activate the central control unit 14 to cause the projector 11A to select and display only pictures of properties meeting the users requirements and simultaneously to cause the LED display unit 16 to display details of the property and/or other relevant information called up by the potential customer or sequentially as pre-programmed in the central control unit 14.

It will be appreciated that the central control means 14 can, when required, control individually both the image displayed and the accompanying text so that the two can be controlled independently, eg



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if different text is to be displayed with a given image in different circumstances.

The central control unit 1 may be located with the apparatus but may, equally, be remote from the projector and connected thereto via a modem or other data communication channel.

As shown in Figures 2 and 3, the projector 11A is preferably mounted in the base of an enclosure 22 which serves to contain the display apparatus and to prevent or reduce the level of ambient light falling on the rear of the screen 13. This is particularly important when a "high gain" screen 13 (see below) is used as such screens are of great optical efficiency and extraneous light would devalue the projected image. The apparatus also preferably comprises an optical system comprising at least one, first surface mirror for increasing the length of the optical path between the projector 11A and the screen 13 and thus increasing the size of the image formed thereon. In a preferred arrangement, as shown in Figures 2 and 3, a first mirror 19 is used to deflect light from the projector 11A in a substantially vertical direction and a larger, second mirror 20 is used to deflect the projected image onto the screen 13. Such an arrangement makes maximum use of the vertical dimension to enlarge the image whilst keeping the depth of the apparatus (ie the dimension perpendicular to the screen 13) to a minimum; the depth preferably being no more than 2m and preferably no more than 0.8m. Indeed, in some applications where the image is to be displayed at above head height, eg in an airport, the enclosure may be extended vertically to increase further the separation between the two mirrors 19 and 20 and thus enable an even larger image to be displayed.

The apparatus is designed at providing a display larger than that provided by a conventional visual display unit (VDU). The image provided on the screen is preferably at least 1m high x 1m wide and more preferably at least 1.5m wide x 2.0m high.

Figures 4 and 5 show an alternative example of display apparatus according to the invention in which the slide projector 11A is replaced by a video projector 11B, eg a liquid crystal video projector and the computer 14 is connected to an interactive CD (CD-i) 21 or similar multi-media CD player. In this case the textual display may be integrated with the visual display.

As shown in Figure 6, the enclosure 22 is preferably set back slightly from the shop window 23 so that a user operating the manual control 15 is at a comfortable viewing distance from the screen 13. The space between the enclosure 22 and shop window 23 can thus be used for the conventional static display of goods. However, in other situations, particularly where viewers would not be immediately adjacent the shop window, the screen 13 may be positioned nearer to or even adjacent the window 23.

It will be appreciated that the image displayed on the screen must be sufficiently bright to be seen in ordinary daylight. To this end it is highly desirable to enclose the apparatus in an enclosure as described above to reduce the level of ambient light falling on the back of the screen. In bright sunshine it may also be necessary to activate a blind as shown in Figure 7 to reduce the amount of external light incident upon the screen. Such a blind may be operated automatically when the brightness of the external light reaches a given threshold. In addition to these measures, a high quality projector and high quality mirrors will help ensure that the maximum amount of light reaches the screen. The screen itself is also preferably of the "high gain" type which incorporates optical components (Fresnel lenses, a front lenticular layer and a prism structure) to reduce loss of light as it is transmitted through the screen.

Figure 9 shows a further embodiment of the display apparatus. In this case, the projector 11 is mounted behind the screen 13 and projects an image directly on to the screen 13.

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In addition to displaying a visual image and associated text, the apparatus described above and shown in any of the Figures may also be provided with audio means for providing an audio output, eg a message or music. This may be provided by any suitable form of audio recording device and loudspeaker system operated under the control of the central control unit and the manually operable control.

Other advantageous uses of a display apparatus according to the invention include the advertising of new and/or second hand cars where a customer can specify his requirements in terms of price range, type of vehicle, engine size, seating capacity and even colour, with the central processor selecting suitable alternatives and displaying these to the potential customer.

Other goods such as clothes may be displayed as they would appear in use, for example the visual images may show the clothes worn by fashion models.

Further such uses include the advertising and promotion of services such as, for example, travel agents displaying the various holidays available to meet a potential customer's requirements.

Such display apparatus according to the invention has a number of advantages over conventional shop window displays.

By using image based technology controlled by the potential customer the shop window becomes an active sales aid rather than being a mere passive display.

A large range of products and/or services may be displayed in succession, with small items enlarged for easy viewing, and high value items, such as for example, jewellery, may be displayed without the need for expensive security measures.

Moreover, in chains of shops or other outlets, programmes can be frequently updated without excessive costs because the same

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programme may be downloaded to each location and/or the location may be connected to a central control via a modem or other data communication link.

Moreover, the central processor by recording all enquiries made through the manually operable control 15 can provide a useful bank of information to assist market research.

The central processor can be pre-programmed to provide one or more messages for each image displayed. In some cases the central processor can be programmed to receive actual orders for goods or services in conjunction with, for example, a credit card swipe machine, or key pad for receiving credit card numbers.

Thus, for example, with each image the text may change a number of times allowing extensive information relating to the displayed visual image to be given.

The text display means may be used to display the same text in several languages simultaneously.

Additionally, in some cases, the text display means may advantageously be arranged such that with one textual display the text is constituted by, say, four lines of twenty one characters in order to give maximum information whilst another textual display relating to the same visual image may comprise only one line extending over the full height of the display thereby giving the text displayed increased visual impact.

Apparatus such as that described above may be used in a wide range of retail situations including advertising applications, eg on advertising "bill boards" or hoardings as well as in shop window displays.

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CLAIMS

1. Retail display apparatus comprising: display means for displaying pre-recorded visual images and associated text, the display means comprising a projector and a back projection screen; programmable central control means for controlling the display means; and manually operable remote control means connected to the central control means for enabling interactive operation of the apparatus by a user.
2. Retail display apparatus as claimed in Claim 1 in which the projector is a slide projector.
3. Retail display apparatus as claimed in Claim 1 or 2 in which the display means comprises an alphanumeric LED display device for displaying text.
4. Retail display apparatus as claimed in claim 1 in which the projector is a video projector.
5. Retail display apparatus as claimed in Claim 4 in which the video projector is connected to an interactive memory device which stores information for the images and associated text available for display.
6. Retail display apparatus as claimed in any preceding claim in which the manually operable remote control means is operable through a sheet of glass.
7. Retail display apparatus as claimed in any preceding claim in which the manually operable remote control means comprises a keypad or touch screen unit.
8. Retail display apparatus as claimed in the preceding claims located within a shop window so as to provide a display of visual images and associated text to people outside the shop.

9. Retail display apparatus as claimed in Claim 8 in which the shop window is provided with an automatic blind which is activated when the brightness of the external light reaches a given threshold, for reducing the light incident upon the screen.
10. Retail display apparatus as claimed in any preceding claim in which the display means comprises an optical system comprising one or more mirrors for increasing the optical path length between the projector and the screen.
11. Retail display apparatus as claimed in Claim 10 in which light from the projector is deflected in a substantially vertical direction by a first mirror and then deflected by a second mirror onto the screen.
12. Retail display apparatus as claimed in any preceding claim in which the back projection screen is a "high-gain" screen, that is it includes optical components to reduce loss of light transmitted therethrough.
13. Retail display apparatus comprising an enclosure for housing at least the display means to reduce the level of ambient light falling on the back of the screen.
14. Retail display apparatus in which the screen has a width of at least 1m and a height of 1m, and preferably a width of at least 2.0m and a height of at least 1.5m.
15. Retail display apparatus as claimed in claim 4 which has a width which corresponds to the width of the screen and a depth, ie perpendicular to the screen, of no more than 2m and preferably no more than 0.8m.
16. Retail display apparatus substantially as hereinbefore described with reference to the accompanying drawings.

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17. A method of advertising products or services characterised in that the products or services are illustrated by pre-recorded images displayed by retail display apparatus as claimed in any of the preceding claims such that the display may be interactively and selectively viewed with associated text by potential customers.
18. A method of advertising products or services substantially as hereinbefore described.

## AMENDED CLAIMS

[received by the International Bureau on 21 October 1994 (21.10.94);  
original claim 1 amended; remaining claims unchanged (1 page)]

1. Retail display apparatus comprising: display means arranged to display pre-recorded visual images and associated text, the display means comprising a projector and a back projection screen; programmable central control means for controlling the display means; and manually operable remote control means connected to the central control means for enabling interactive operation of the apparatus by a user.
2. Retail display apparatus as claimed in Claim 1 in which the projector is a slide projector.
3. Retail display apparatus as claimed in Claim 1 or 2 in which the display means comprises an alphanumeric LED display device for displaying text.
4. Retail display apparatus as claimed in claim 1 in which the projector is a video projector.
5. Retail display apparatus as claimed in Claim 4 in which the video projector is connected to an interactive memory device which stores information for the images and associated text available for display.
6. Retail display apparatus as claimed in any preceding claim in which the manually operable remote control means is operable through a sheet of glass.
7. Retail display apparatus as claimed in any preceding claim in which the manually operable remote control means comprises a keypad or touch screen unit.
8. Retail display apparatus as claimed in the preceding claims located within a shop window so as to provide a display of visual images and associated text to people outside the shop.

AMENDED SHEET (ARTICLE 19)



**STATEMENT UNDER ARTICLE 19**

The claimed invention relates to retail display apparatus having a novel combination of features including: display means in the form of a projector and a back projection screen (which is capable of providing better quality images, larger images and brighter images than a CRT); the display means being arranged to display both visual images and associated text; programmable central control means; and manually operable remote control means to provide for interactive operation by a user.

None of the cited prior art documents disclose this combination of features. The majority of the prior art use CRTs which are not suitable for providing large, bright, high-quality images suitable for use in a shop window. FR-A-2228261 does not appear to provide a textual display and several of the prior art documents do not disclose interactive operation by the user.

The prior art documents taken individually or together do not teach towards this combination of features and, in particular, are not directed to the provision of retail display apparatus which is capable of providing a large, high quality display in a bright environment such as a shop window.

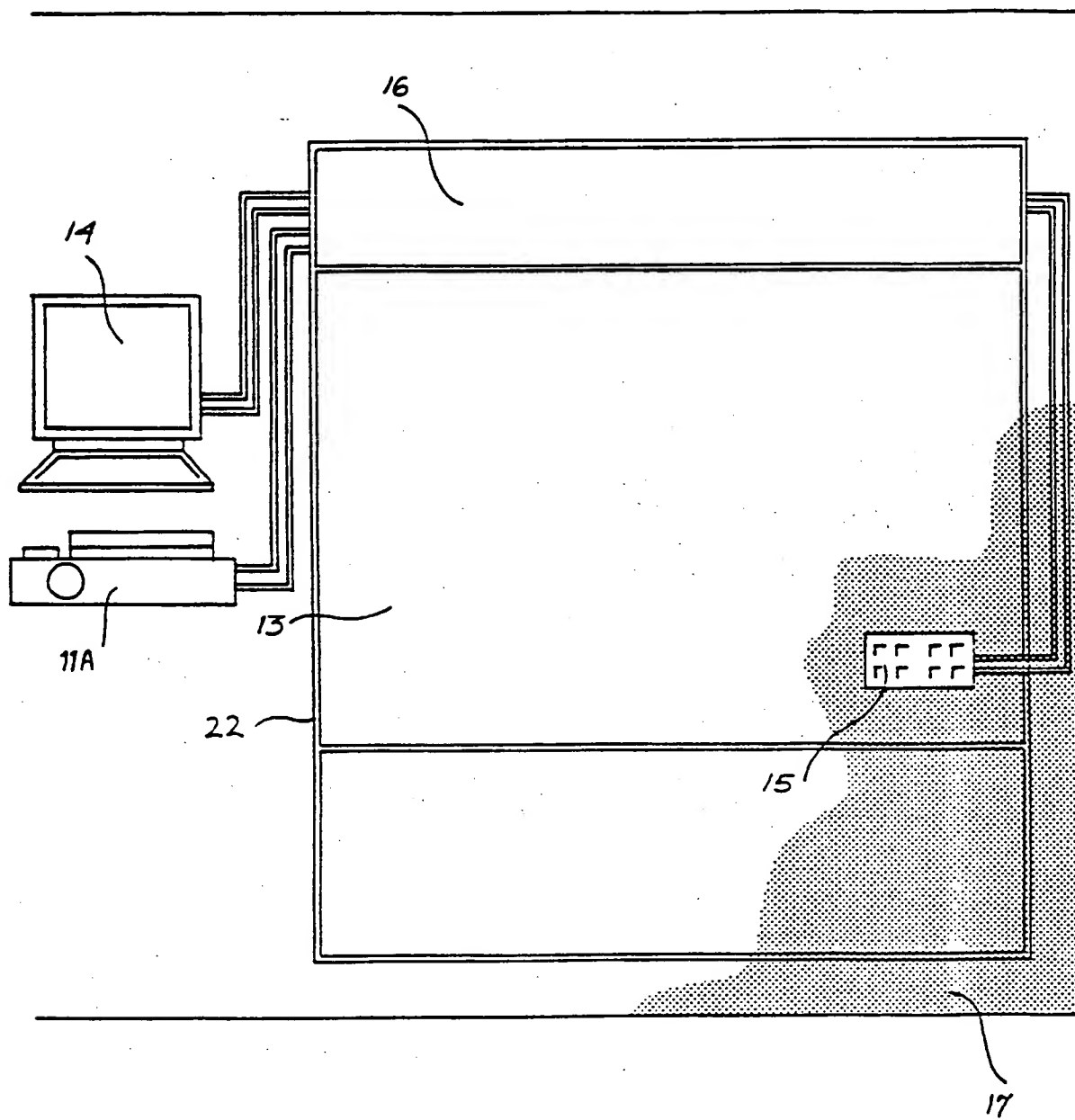


FIGURE 1

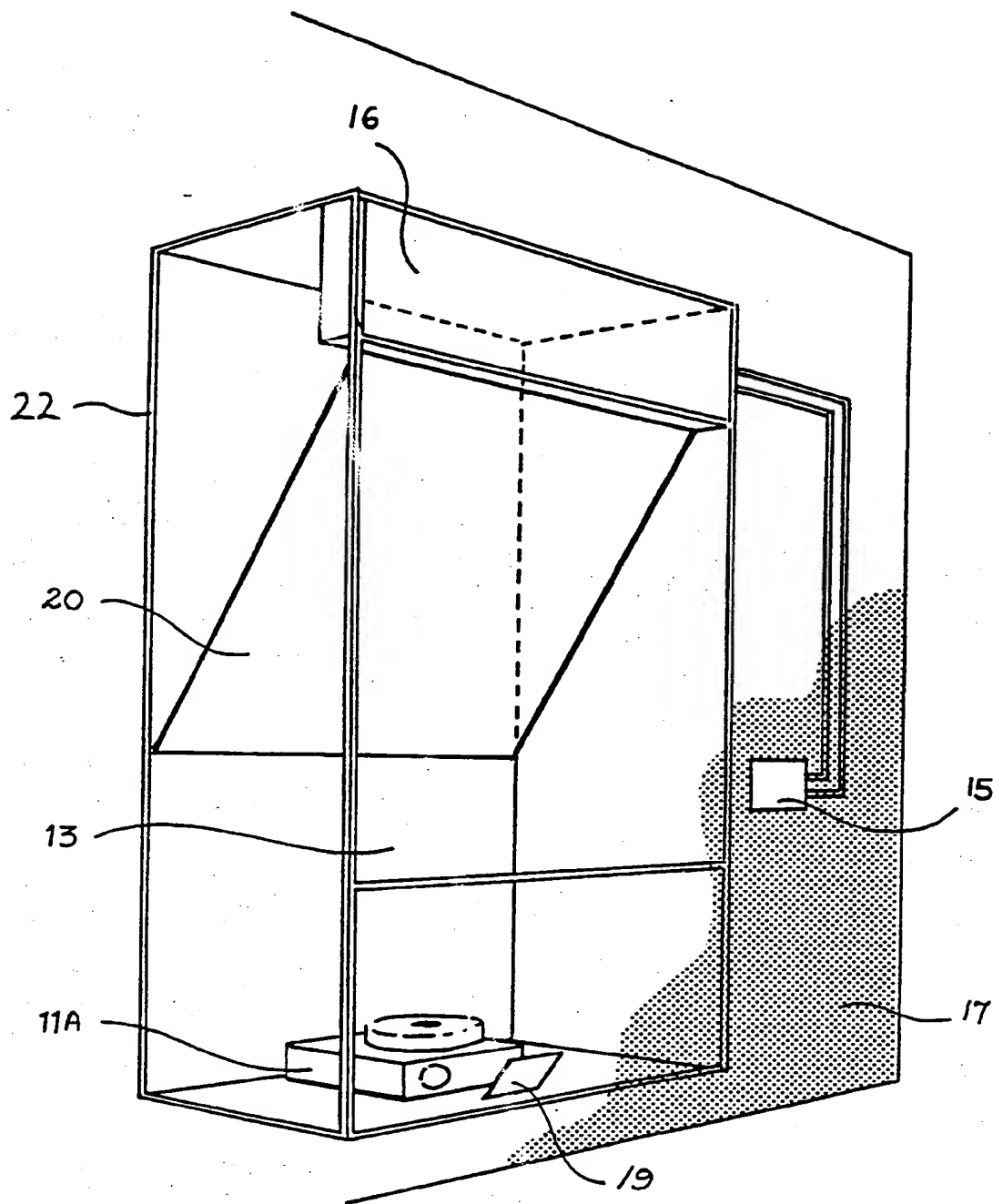


FIGURE 2

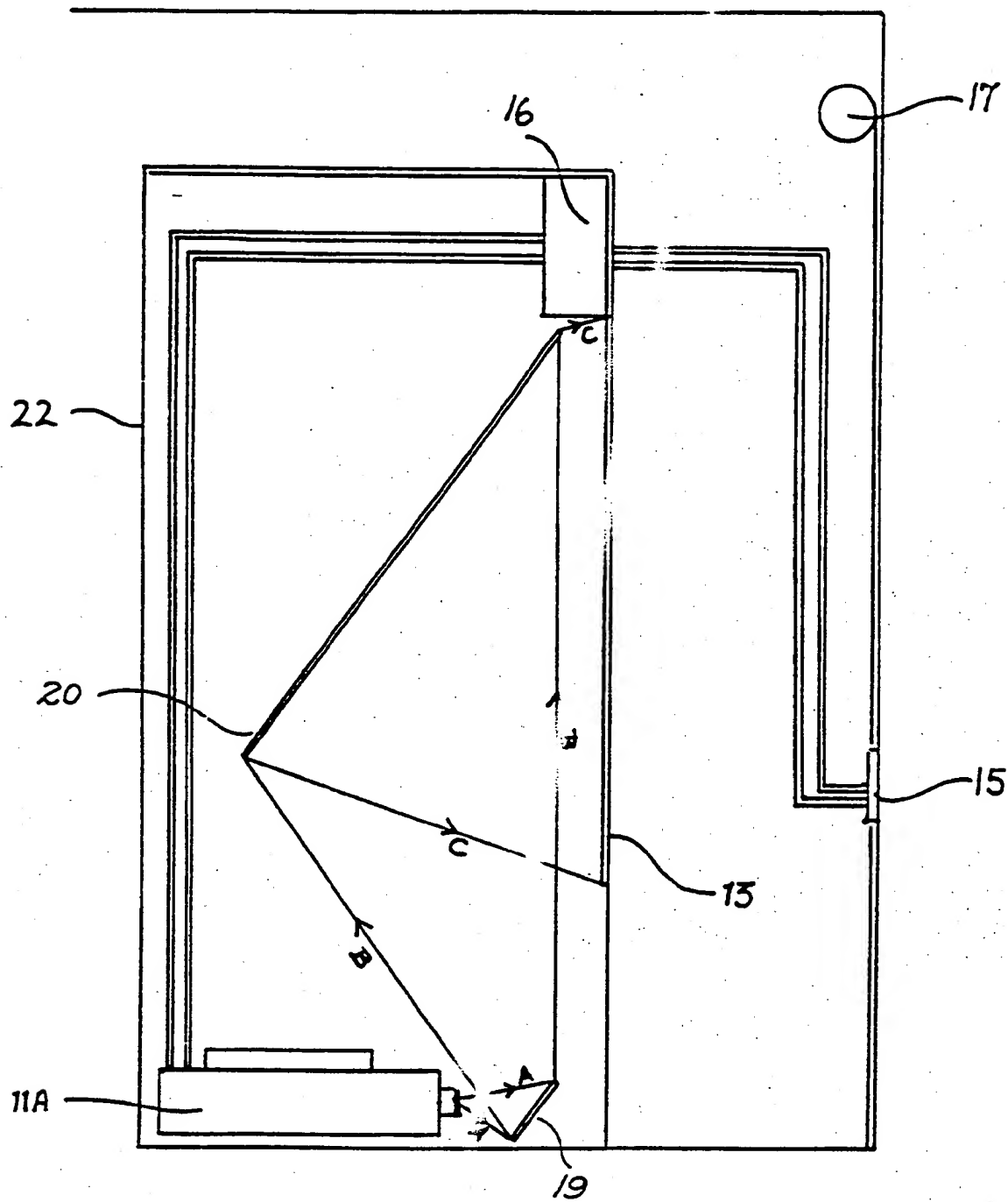


FIGURE 3

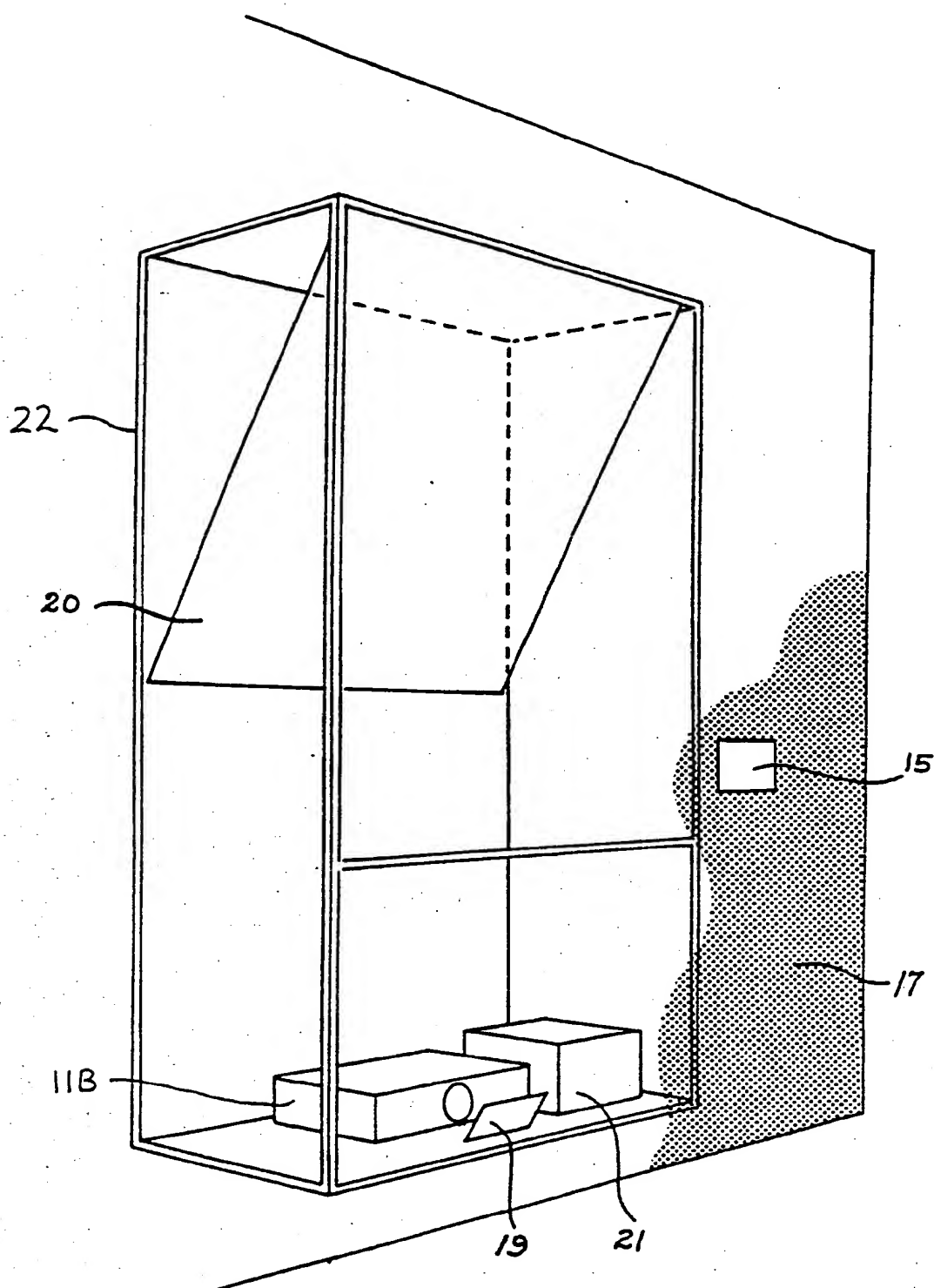


FIGURE 4

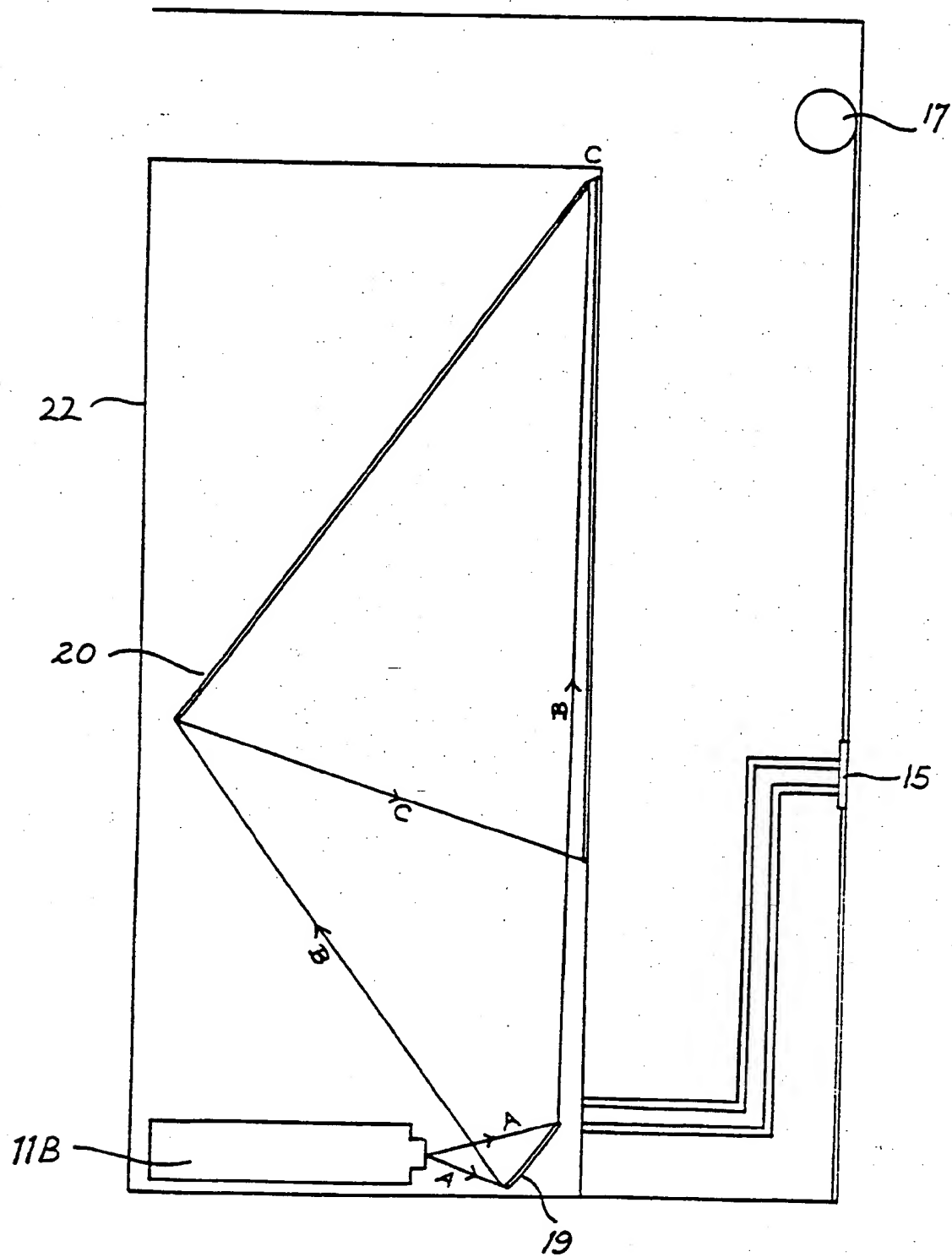
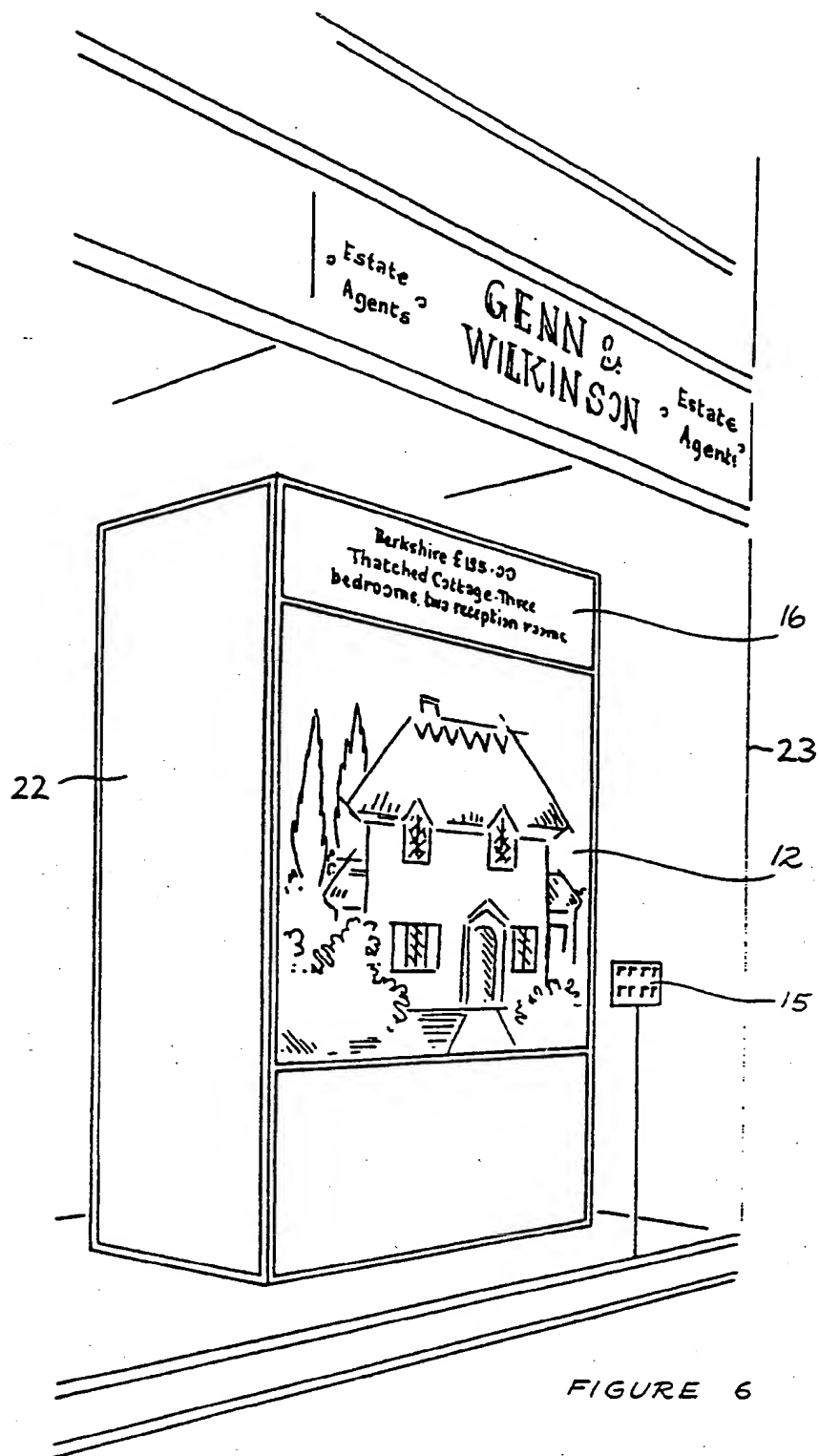


FIGURE 5



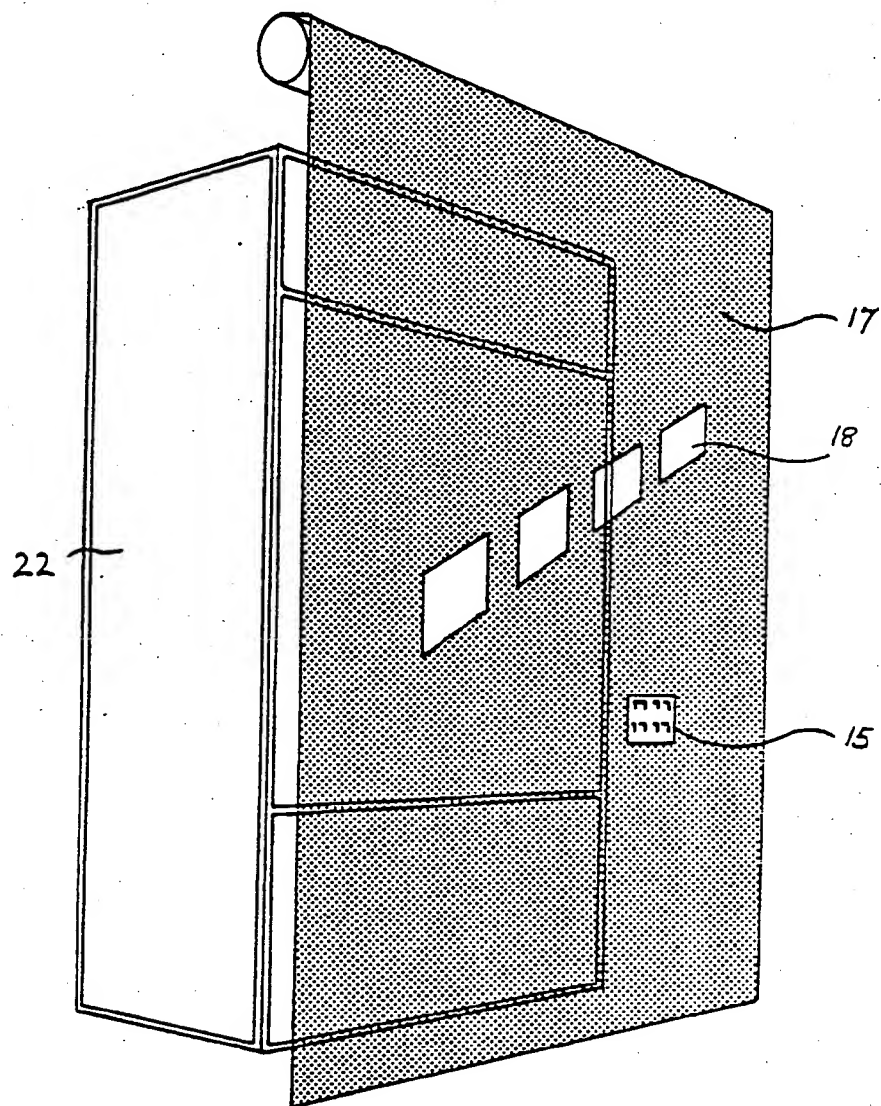


FIGURE 7



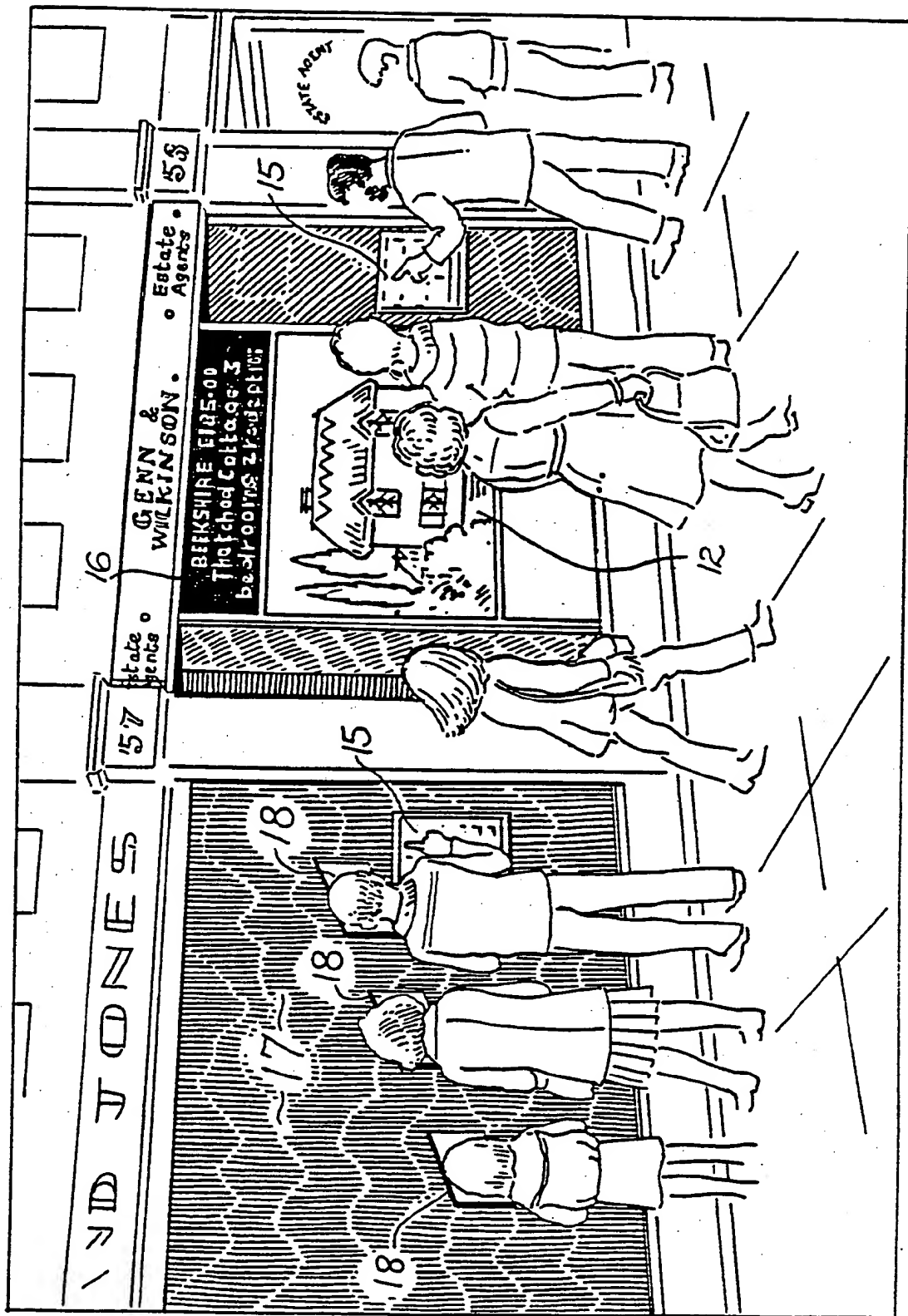


FIGURE 8

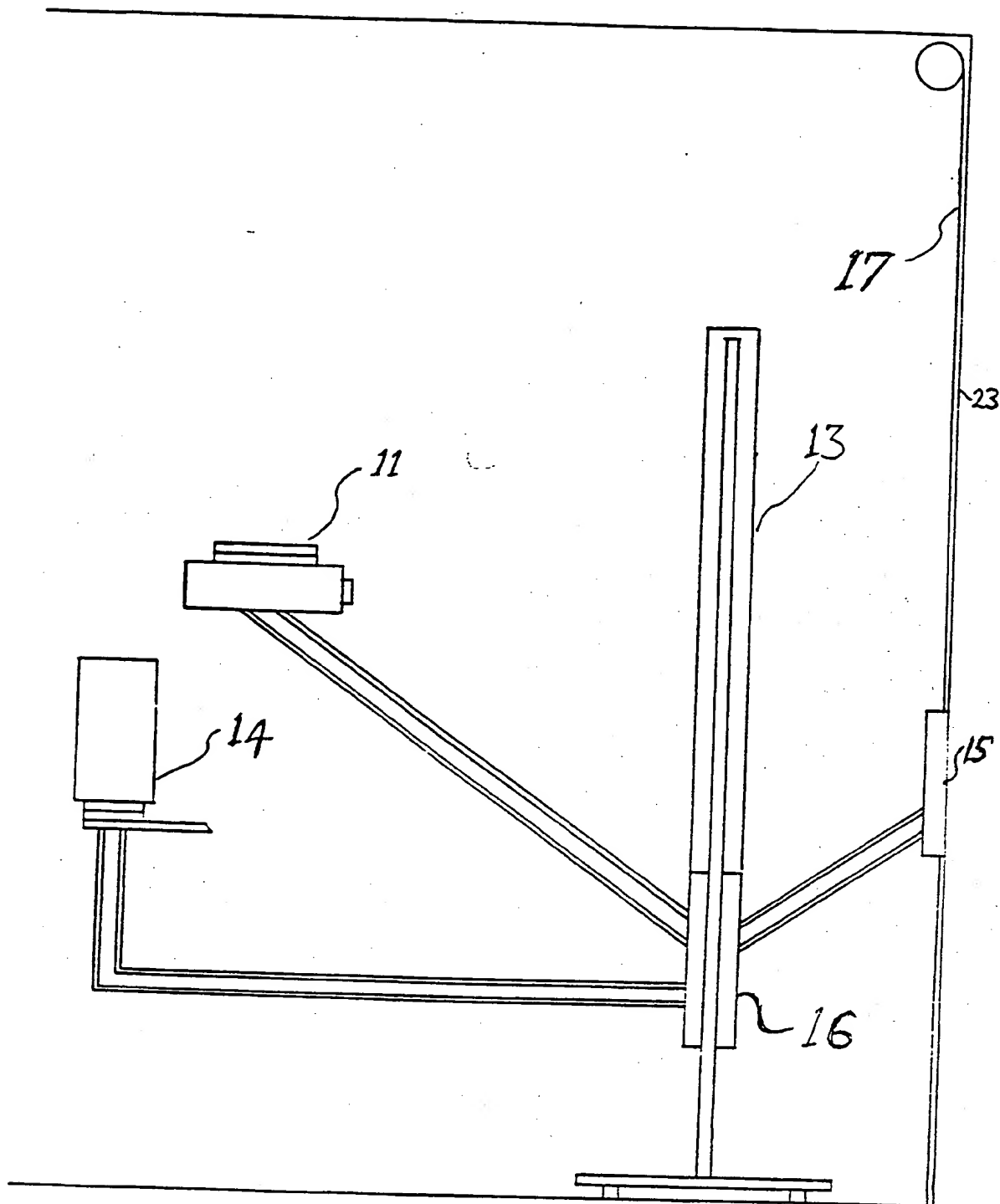


FIGURE 9

## INTERNATIONAL SEARCH REPORT

Intern. Appl. No.

PCT/GB 94/01297

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 5 G09F27/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 5 G09F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,3 861 792 (W. DONATI) 21 January 1975 see the whole document ---	1,2,4, 16-18
X	FR,A,2 228 261 (P. PETER) 29 November 1974	1,2,7, 10,11, 16-18
Y	see the whole document ---	9
Y	US,A,4 701 627 (P. GAMBUTTI ET AL.) 20 October 1987 see column 3, line 50 - line 53; figures 1,9 ---	9
Y	WO,A,92 02920 (D. KNOCH) 20 February 1992 see the whole document ---	1-5,7, 13,16-18
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

19 August 1994

Date of mailing of the international search report

24.08.94

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## INTERNATIONAL SEARCH REPORT

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PCT/GB 94/01297

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE,U,89 11 029 (A. STHÜMER) 29 March 1990 see the whole document ---	1-5,7, 13,16-18
X	US,A,4 677 570 (H. TAKI) 30 June 1987 see the whole document ---	1,4,5,7, 16-18
X	CH,A,674 778 (J. GARGANTINI) 13 July 1990 see page X ---	1,4,5,7, 16-18
A	FR,A,2 629 244 (C.BOUVIER) 29 September 1989 -----	

## INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern. Appl. Application No

PCT/GB 94/01297

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-3861792	21-01-75	NONE	
FR-A-2228261	29-11-74	NONE	
US-A-4701627	20-10-87	NONE	
WO-A-9202920	20-02-92	NONE	
DE-U-8911029	29-03-90	NONE	
US-A-4677570	30-06-87	JP-C- 1579513	13-09-90
		JP-B- 2003224	22-01-90
		JP-A- 60116072	22-06-85
CH-A-674778	13-07-90	NONE	
FR-A-2629244	29-09-89	NONE	

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